

Patent Claims

**REPLACED BY
ART 34 AMDT**

1. A superconductor device
 - having a magnet which contains at least one super-
 - 5 conductive winding without any refrigerant,
 - having a refrigeration unit which has at least one
 - cold head,
 - and
 - having means for thermal coupling of the at least
 - 10 one winding to the at least one cold head,
 - characterized in that the thermal coupling means are in
 - the form of a line system (10) having at least one
 - pipeline (10a, 10b; 15i) for a refrigerant (k1, k1';
 - k2) which circulates in it on the basis of a thermo-
 - 15 siphon effect.
2. The device as claimed in claim 1, characterized in
- that the line system (10) has two pipelines (10a, 10b)
- which are filled with different refrigerants (k1 and
- 20 k2, respectively) with different condensation
- temperatures.
3. The device as claimed in claim 2, characterized in
- that the pipelines (10a, 10b) are thermally coupled to
- 25 a common cold head (6).
4. The device as claimed in claim 2, characterized in
- that the pipelines are thermally coupled to separate
- cold heads.
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5. The device as claimed in one of the preceding
- claims, characterized in that at least parts of the at
- least one pipeline (10a, 10b) have a gradient with
- respect to the horizontal (h) of more than 0.5°,
- 35 preferably more than 1°.

6. The device as claimed in one of the preceding claims, characterized in that the cross section (q) of the at least one pipeline (10a, 10b) which carries the refrigerant (k1, k1'; k2) is less than 10 cm².

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7. The device as claimed in one of the preceding claims, characterized in that the superconductive winding (4a, 4b; 14j) contains high-T_c superconductor material.

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8. The device as claimed in claim 7, characterized in that the superconductor material must be kept at a temperature below 77 K.

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9. The device as claimed in one of the preceding claims, characterized in that a mixture of two or more refrigerant components with different condensation temperatures is provided as the refrigerant (k1 or k2, respectively).

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10. The device as claimed in one of the preceding claims, characterized in that the superconductive magnet (3, 13) is part of an MRI installation.